

35th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science

FSTTCS 2015, December 16–18, 2015, Bangalore, India

Edited by

Prahladh Harsha

G. Ramalingam



Editors

Prahladh Harsha	G. Ramalingam
Tata Institute of Fundamental Research	Microsoft Research India
Mumbai 400005	Bangalore 560001
India	India
prahladh@tifr.res.in	grama@microsoft.com

ACM Classification 1998

D.2.4 Software/Program Verification, F.1.1 Models of Computation, F.1.2 Modes of Computation, F.1.3 Complexity Measures and Classes, F.2.2 Nonnumerical Algorithms and Problems, F.3.1 Specifying and Verifying and Reasoning about Programs, F.4.1 Mathematical Logic, F.4.3 Formal Languages

ISBN 978-3-939897-97-2

Published online and open access by

Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany. Online available at <http://www.dagstuhl.de/dagpub/978-3-939897-97-2>.

Publication date

December, 2015

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

License

This work is licensed under a Creative Commons Attribution 3.0 Unported license (CC-BY 3.0): <http://creativecommons.org/licenses/by/3.0/legalcode>.



In brief, this license authorizes each and everybody to share (to copy, distribute and transmit) the work under the following conditions, without impairing or restricting the authors' moral rights:

- Attribution: The work must be attributed to its authors.

The copyright is retained by the corresponding authors.

Digital Object Identifier: 10.4230/LIPIcs.FSTTCS.2015.i

ISBN 978-3-939897-97-2

ISSN 1868-8969

<http://www.dagstuhl.de/lipics>

■ Contents

Preface	ix
Conference Organization	xi
External Reviewers	xiii

Invited Talks

Bypassing Worst Case Analysis: Tensor Decomposition and Clustering <i>Moses S. Charikar</i>	1
Checking Correctness of Concurrent Objects: Tractable Reductions to Reachability <i>Ahmed Bouajjani, Michael Emmi, Constantin Enea, and Jad Hamza</i>	2
Reachability Problems for Continuous Linear Dynamical Systems <i>James Worrell</i>	5
Convexity, Bayesianism, and the Quest Towards Optimal Algorithms <i>Boaz Barak</i>	7
Beyond Matrix Completion <i>Ankur Moitra</i>	8
Relational Refinement Types for Higher-Order Shape Transformers <i>Suresh Jagannathan</i>	9

Contributed Papers

Session 1A

Robust Reoptimization of Steiner Trees <i>Keshav Goyal and Tobias Mömke</i>	10
Minimizing Weighted ℓ_p -Norm of Flow-Time in the Rejection Model <i>Anamitra Roy Choudhury, Syamantak Das, and Amit Kumar</i>	25
On Correcting Inputs: Inverse Optimization for Online Structured Prediction <i>Hal Daumé III, Samir Khuller, Manish Purohit, and Gregory Sanders</i>	38
Dynamic Sketching for Graph Optimization Problems with Applications to Cut-Preserving Sketches <i>Sepehr Assadi, Sanjeev Khanna, Yang Li, and Val Tannen</i>	52

Session 1B

Weighted Strategy Logic with Boolean Goals Over One-Counter Games <i>Patricia Bouyer, Patrick Gardy, and Nicolas Markey</i>	69
Decidability in the Logic of Subsequences and Supersequences <i>Prateek Karandikar and Philippe Schnoebelen</i>	84



Fragments of Fixpoint Logic on Data Words <i>Thomas Colcombet and Amaldev Manuel</i>	98
---	----

Efficient Algorithms for Morphisms over Omega-Regular Languages <i>Lukas Fleischer and Manfred Kufleitner</i>	112
--	-----

Session 2A

Approximating the Regular Graphic TSP in Near Linear Time <i>Ashish Chiplunkar and Sundar Vishwanathan</i>	125
---	-----

On Weighted Bipartite Edge Coloring <i>Arindam Khan and Mohit Singh</i>	136
--	-----

Deciding Orthogonality in Construction-A Lattices <i>Karthekeyan Chandrasekaran, Venkata Gandikota, and Elena Grigorescu</i>	151
---	-----

Session 2B

Ordered Tree-Pushdown Systems <i>Lorenzo Clemente, Paweł Parys, Sylvain Salvati, and Igor Walukiewicz</i>	163
--	-----

One-way Definability of Sweeping Transducers <i>Félix Baschenis, Olivier Gauwin, Anca Muscholl, and Gabriele Puppis</i>	178
--	-----

What's Decidable about Availability Languages? <i>Parosh Aziz Abdulla, Mohamed Faouzi Atig, Roland Meyer, and Mehdi Seyed Salehi</i>	192
---	-----

Session 3A

Towards Better Separation between Deterministic and Randomized Query Complexity <i>Sagnik Mukhopadhyay and Swagato Sanyal</i>	206
--	-----

Dimension, Pseudorandomness and Extraction of Pseudorandomness <i>Manindra Agrawal, Diptarka Chakraborty, Debarati Das, and Satyadev Nandakumar</i>	221
--	-----

On the NP-Completeness of the Minimum Circuit Size Problem <i>John M. Hitchcock and A. Pavan</i>	236
---	-----

Counting Euler Tours in Undirected Bounded Treewidth Graphs <i>Nikhil Balaji, Samir Datta, and Venkatesh Ganesan</i>	246
---	-----

Session 3B

Revisiting Robustness in Priced Timed Games <i>Shibashis Guha, Shankara Narayanan Krishna, Lakshmi Manasa, and Ashutosh Trivedi</i>	261
--	-----

Simple Priced Timed Games are not That Simple <i>Thomas Brihaye, Gilles Geeraerts, Axel Haddad, Engel Lefaucheur, and Benjamin Monmege</i>	278
---	-----

Quantitative Games under Failures <i>Thomas Brihaye, Gilles Geeraerts, Axel Haddad, Benjamin Monmege, Guillermo A. Pérez, and Gabriel Renault</i>	293
Games with Delays – A Frankenstein Approach <i>Dietmar Berwanger and Marie van den Bogaard</i>	307
Session 4A	
Forbidden Extension Queries <i>Sudip Biswas, Arnab Ganguly, Rahul Shah, and Sharma V. Thankachan</i>	320
On Density, Threshold and Emptiness Queries for Intervals in the Streaming Model <i>Arijit Bishnu, Amit Chakrabarti, Subhas C. Nandy, and Sandeep Sen</i>	336
Clustering on Sliding Windows in Polylogarithmic Space <i>Vladimir Braverman, Harry Lang, Keith Levin, and Morteza Monemizadeh</i>	350
Session 4B	
Congestion Games with Multisets of Resources and Applications in Synthesis <i>Guy Avni, Orna Kupferman, and Tami Tamir</i>	365
The Sensing Cost of Monitoring and Synthesis <i>Shaul Almagor, Denis Kuperberg, and Orna Kupferman</i>	380
An ω -Algebra for Real-Time Energy Problems <i>David Cachera, Uli Fahrenberg, and Axel Legay</i>	394
Session 5A	
Parameterized Complexity of Secluded Connectivity Problems <i>Fedor V. Fomin, Petr A. Golovach, Nikolay Karpov, and Alexander S. Kulikov</i> ...	408
Parameterized Algorithms for Deletion to (r, ℓ) -Graphs <i>Sudeshna Kolay and Fahad Panolan</i>	420
Finding Even Subgraphs Even Faster <i>Prachi Goyal, Pranabendu Misra, Fahad Panolan, Geevarghese Philip, and Saket Saurabh</i> 434	
The Parameterized Complexity of the Minimum Shared Edges Problem <i>Till Fluschnik, Stefan Kratsch, Rolf Niedermeier, and Manuel Sorge</i>	448
Session 5B	
Control Improvisation <i>Daniël J. Fremont, Alexandre Donzé, Sanjit A. Seshia, and David Wessel</i>	463
A Provably Correct Sampler for Probabilistic Programs <i>Chung-Kil Hur, Aditya V. Nori, Sriram K. Rajamani, and Selva Samuel</i>	475

On the Problem of Computing the Probability of Regular Sets of Trees <i>Henryk Michalewski and Matteo Mio</i>	489
--	-----

Probabilistic Regular Expressions and MSO Logic on Finite Trees <i>Thomas Weidner</i>	503
--	-----

Session 6A

Rumors Across Radio, Wireless, and Telephone <i>Jennifer Iglesias, Rajmohan Rajaraman, R. Ravi, and Ravi Sundaram</i>	517
--	-----

The Price of Local Power Control in Wireless Scheduling <i>Magnús M. Halldórsson and Tigran Tonoyan</i>	529
--	-----

Allocation of Divisible Goods Under Lexicographic Preferences <i>Leonard J. Schulman and Vijay V. Vazirani</i>	543
---	-----

Session 6B

On the Expressiveness of Multiparty Sessions <i>Romain Demangeon and Nobuko Yoshida</i>	560
--	-----

Secure Refinements of Communication Channels <i>Vincent Cheval, Véronique Cortier, and Eric le Morvan</i>	575
--	-----

Failure-aware Runtime Verification of Distributed Systems <i>David Basin, Felix Klaedtke, and Eugen Zălinescu</i>	590
--	-----